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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,355	07/06/2006	Takayuki Ohmura	128657	2788
25944 7590 03/17/2010 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
BREVAIL, ELMITO				
ART UNIT		PAPER NUMBER		
2889				
NOTIFICATION DATE		DELIVERY MODE		
03/17/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com  
jarnstrong@oliff.com

### Office Action Summary

**Application No.**

10/585,355

**Applicant(s)**

OHMURA ET AL.

**Examiner**

ELMITO BREVAL

**Art Unit**

2889

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 12 and 13 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8-11 and 14-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The amendment filed on 12/17/2009 has been entered.

#### ***Response to Arguments***

Applicant's arguments filed 12/17/2009 have been fully considered but they are not persuasive. The applicant has made one argument: (1), Ohmura's (US. Pat: 5,616,987) reference does not teach the newly added limitation "each dynode extending in a prescribed direction, the plurality of dynodes having a first dynode having an edge in the prescribed direction and a second dynode having an edge in the prescribed direction, the first dynode receiving electrons from the cathode and multiplying the electrons and emitting the multiplied electrons, and the second dynode receiving the electrons from the first dynode and multiplying the electrons and emitting the multiplied electrons."

In response to the argument: the examiner respectfully disagrees. Ohmura ('987) teaches (in at least figs. 7-9; figs. 8 and 9 are enlarged view of fig. 7) a photomultiplier tube comprising: a vacuum chamber constructed from a substantially spherical light-receiving surface (1), a bulb portion (2), and a cylindrical stem portion (3) serving as a stand base; a photoelectric cathode (5) is formed on the inner surface of the light receiving surface (1); a plurality of dynodes (Dy1, Dy) multiplying electrons emitted from the cathode; each dynode extending in a prescribed direction (best seen in figs. 8 and 9; i.e. Dy1 and Dy both extend in a prescribed direction), the plurality of dynodes having a first dynode (Dy1) having an edge in the prescribed direction and a second dynode (Dy) having an edge in the prescribed direction (see at least figs. 8 and 9), the first

dynode (Dy1) receiving electrons from the cathode (5) and multiplying the electrons and emitting the multiplied electrons, and the second dynode (Dy) receiving the electrons from the first dynode and multiplying the electrons and emitting the multiplied electrons;

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7, 12, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohmura et al., (US. Pat: 5, 616,987) of record by the applicant.

**Regarding claim 1**, Ohmura ('987) teaches (in at least figs. 7-9; figs. 8 and 9 are enlarged view of fig. 7) a photomultiplier tube comprising: a vacuum chamber constructed from a substantially spherical light-receiving surface (1), a bulb portion (2), and a cylindrical stem portion (3) serving as a stand base; a photoelectric cathode (5) is formed on the inner surface of the light receiving surface (1); a plurality of dynodes (Dy1, Dy) multiplying electrons emitted from the cathode; each dynode extending in a prescribed direction (best seen in figs. 8 and 9; i.e. Dy1 and Dy both extend in a prescribed direction), the plurality of dynodes having a first dynode (Dy1) having an edge in the prescribed direction and a second dynode (Dy) having an edge in the prescribed direction (see at least figs. 8 and 9), the first dynode (Dy1) receiving electrons from the cathode (5) and multiplying the electrons and emitting the multiplied

electrons, and the second dynode (Dy) receiving the electrons from the first dynode and multiplying the electrons and emitting the multiplied electrons; and potential regulating means (10; i.e. the plate electrode) disposed in a prescribed position (best seen in figs. 8 and 9), between the edge of the first dynode (Dy1) and the edge of the second dynode (Dy), and smoothing an equipotential surface (S) in a space between the first dynode (Dy1) and the second dynode (Dy) along the prescribed direction.

**Regarding claim 2**, Ohmura ('987) teaches (in at least figs. 8 and 9) the plate electrode (10; i.e. the potential regulating means) disposed between the edge of the first dynode (Dy1) and the edge of the group of dynodes (Dy; note: Dy contains Dy2 up Dy9) and arranged substantially parallel to a side wall of the first dynode (dy1) and separated from the first dynode (Dy1); a 720 volts is applied to the plate electrode to produce an higher potential than the potential of the first dynode (Dy1) which is 704v (col. 6, lines 32-40).

**Regarding claim 3**, Ohmura ('987) teaches (in at least figs. 8 and 9) the plurality of dynodes (Dy1, Dy) further have a third dynode (Dy3; best seen in fig. 9) having an edge in the prescribed direction and receiving the electrons from the second dynode and multiplying and emitting the electrons; the plate electrode (10; i.e. the electron lens forming electrode) is electrically connected to the edge of the third electrode (Dy3).

**Regarding claim 4**, Ohmura ('987) teaches (in at least figs. 8 and 9) the plate electrode (10; i.e. the electron lens forming electrode) is separated from the plurality of dynodes (dy).

**Regarding claims 7, 12, and 13** Ohmura ('987) teaches (in at least figs. 5, 7, 8, and 9; the cathode, vessel, plate electrode do not label in fig. 5; figs. 8 and 9 are enlarged view of fig. 7) the cathode (5 of fig. 7) the dynodes (113, 114, 115), and the plate electrode (10 of fig. 8 and 9) are disposed in a hermetically sealed vessel (1) that is cylindrical in shape and sealed on both ends; the light enters the hermetically sealed vessel (1) from one end thereof; dynodes (113, 114, 115 of fig. 5) are concave and substantially arc-shaped, the first dynode (113) opening substantially toward the one end of the hermetically sealed vessel (1), the second dynode (114) opening substantially toward another end of the hermetically sealed vessel (1) and the third dynode (115) opening substantially toward the one end of the hermetically sealed vessel (1), and the electrons impinge on and are emitted from inner surfaces of the dynodes; the lens forming electrode (10; i.e. the plate electrode) forms a fan shape (the examiner interprets the shape of the plate electrode to be a fan shape).

***Allowable Subject Matter***

Claims 5, 6, 8-11, 14-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 5, 8, 9 and 20, the prior art of record Ohmura et al., (US. Pat: 5, 616,987) teaches (in at least figs. 7-9; figs. 8 and 9 are enlarged view of fig. 7) a photomultiplier tube comprising: a vacuum chamber constructed from a substantially spherical light-receiving surface (1), a bulb portion (2), and a cylindrical stem portion (3) serving as a stand base; a photoelectric cathode (5) is formed on the inner surface of

the light receiving surface (1); a plurality of dynodes (Dy1, Dy) multiplying electrons emitted from the cathode; each dynode extending in a prescribed direction (best seen in figs. 8 and 9; i.e. Dy1 and Dy both extend in a prescribed direction), the plurality of dynodes having a first dynode (Dy1) having an edge in the prescribed direction and a second dynode (Dy) having an edge in the prescribed direction (see at least figs. 8 and 9), the first dynode (Dy1) receiving electrons from the cathode (5) and multiplying the electrons and emitting the multiplied electrons, and the second dynode (Dy) receiving the electrons from the first dynode and multiplying the electrons and emitting the multiplied electrons; and potential regulating means (10; i.e. the plate electrode) disposed in a prescribed position (best seen in figs. 8 and 9), between the edge of the first dynode (Dy1) and the edge of the second dynode (Dy), and smoothing an equipotential surface (S) in a space between the first dynode (Dy1) and the second dynode (Dy) along the prescribed direction.

However, the prior art of record neither anticipates nor renders obvious to one of ordinary skill in the art the photomultiplier tube comprising a second electrode lens forming electrode disposed between an edge of the second dynode and an edge of the third dynode and arranged substantially parallel to the electron lens forming electrode and separated from the second dynode; and wherein a voltage is applied to the second electron lens forming electrode to produce a higher potential than the potential in the second dynode. Due to their dependency, claims 6, 10, 11, 14-19 and 21 are necessarily allowable.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ELMITO BREVAL** whose telephone number is (571)270-3099. The examiner can normally be reached on M-F (8:30 AM-5:00 Pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

March 1, 2010  
/Elmito Breval/  
Examiner, Art Unit 2889

/Bumsuk Won/  
Primary Examiner, Art Unit 2889